act of abstracting, by which he sets aside from thought the qualitative attributes of things which constitute their individuality, and from the exercise of the generalizing faculty, by which he gathers them together under a quantitative aspect, how to withdraw his attention more and more from the concrete qualities of things and still to retain a vigorous mental grasp upon them. If the teacher is careful to have the pupil always work rationally with numbered things, either physically or mentally present, he will find him more ready than he thinks to perform the mental act by which the individual, with its qualitative differences, is dropped from thought, or better, is submerged to an extent, and the general, with its quantitative likenesses, is elevated into prominence. This is merely a roundabout way of saying that the abstract idea of number must be reached as a generalization from the concrete numbered thing. It would therefore be equally unpsychological to use no concrete things at all in number teaching, and never to use anything else. Number is in its essence abstract, but let us not forget that the road to its hidden mysteries lies through the concrete.

While much of the number work of the elementary grades is open to the criticism of being fragmentary, even to the verge of frivolousness, there is danger of going too far to the other extreme. The motive for the doing of the number work must be present to the child's mind with sufficient clearness to make a decided appeal to him. To draw his number work from a problem so complicated in its details, such as the determination of the cost of the materials and erection of an elaborate structure, requires too great continuity of thought, depends upon the appreciation of the value of a motive too ultimate to make a strong appeal to him, for the pupil to profit by it.

Such problems, at too early a stage, are practically without a motive for the child, though they may appeal strongly to the adult.

Topics for the preparation of papers and discussions:

1. Discuss the number work done in connection with the topographic map of the park with reference to its place and value in the grades.

2. What is meant to-day by the study of arithmetic for its utility? How does this differ from what was meant formerly by utility as an end of number study?

3. What should be allowed to become mechanical with the pupil in arithmetic, and what should not?

4. Is it ever wise to attempt to secure mechanical skill in the performance of operations which the attainment or maturity of the pupil make it impossible for him to understand at the time?

5. Should the maxim, "Tell the child as little as possible, and allow him to discover for himself as much as possible," be understood to mean, "Tell the child nothing at all"? Substantiate your answer.

6. What is meant by inductive methods of teaching? By deductive? Give an example of each. When should arithmetical study be made largely inductive, and when should deduction be begun?

Physical Training

Carl J. Kroh Caroline Crawford

The living worker, apt and of insight, is not slow to appreciate the fact that methods of study based upon mere statement of fact are not productive of lasting results. He enhances his study by a wise direction of effort toward the establishment of fundamental facts. Information and experience are gathered in the practical

pursuit and study of the essentials of his particular subject; the relative values of procedures are adjudged in diligent practice and observation of work. Persistent effort in the search for fundamental facts is regarded essential to success.

Whatever the phase of work or order of investigation engaging the student of physical education, he is confronted with varied and complex problems, the nature of which not infrequently leads him to infer that some of the weightier questions affecting his particular study have not been generally exploited. Indeed, the range of application of the tenets of physical education is so wide and diverse that he finds his strongest incentive for the development of a healthy, vigorous, gladsome, and robust youth in the possible extension of his influence beyond the purposes of school and through life as a totality.

The practical work offers him a sheer endless chain of sequences, in concord with which he strives to systematize his material, that he may readily harmonize ends and means. He becomes proficient in measuring effort and learns to graduate his work as per indications of age, sex, and skill. He avoids excess by carefully distinguishing between healthful, orderly, and pleasurable gymnastic training, as contrasted with merely formal drill or mere pleasurable activity for the sake of recreation. He realizes the value of pedagogical procedure in this training, and the fact that much care, a set purpose, patience, and perseverance are needed to subserve the best interests of all and to establish permanent results.

In seeking to perpetuate the characteristics of this educational discipline, he studies the life as portrayed in the work of the gymnasium, a study of human nature at first-hand, expression in all its phases, of body, mind, and soul. He studies not only the physical, but the mental, social, and spiritual being as well, and as his conception of the uses of his particular subject enlarges, he adjusts and readjusts his methods in conformity with the teachings of science, avoiding all forms of specialization which are one-sided and of questionable value. His interpretation of proper methods of class, group, and individual work is based upon the character-index of the pupils as revealed in the free and organized play of the children, in the gymnastic exercises, games, and athletic sports of the elder youth, by the quality of control and of restraint of self manifested, by the quickened pulse and readiness with which the pupils respond to all reasonable behests. Thus he comprehends the larger import of educational gymnastics, encompassing so much that is needed for the enhancement of life and school work.

Free Gymnastics: The work in the gymnasium of the Grammar and High-School grades illustrated the sequent order of free exercises,* and numerous movement forms correlated with general and applied gymnastics.† The methods characteristic of the latter illustration were distinct from those of the former. One-half the time of the regular periods, three times a week, was devoted to this practice. Classroom work so far has been dispensed with.

There is a practical agreement with reference to the value of free gymnastics as a corrective means. Their importance as

*The effectiveness of the different movements and exercises employed in free gymnastics depends upon the order of their construction and modes of execution. The construction of an exercise is designed in accord with its purpose. It entails the consideration of certain factors which determine its gymnastic character. Force and resistance are variously employed in estimating effectiveness. The laws of leverage, applied in the gradation of work and the relation of basic positions to effort and effect, are of first importance in considering sequential order. The general or specific design of a lesson is also determinative in the selection of exercises with reference to form, kind, and order. Frequency of periods, regularity, space, and time are factors in progress.

†See next number of the COURSE OF STUDY.

a fundamental work in body building is recognized. Views expressed with reference to the conduct of this branch of gymnastic work, however, show a wide diversity of ideas.

It is intended that the work as presented shall prove helpful to the students who attend the regular lessons as observers. It is suggestive of the modifications indicated in a regular course of instruction.

Suggestions: I. The classification or the grouping of pupils for gymnastic purposes should be based on a careful consideration of individual conditions and qualifications.

II. Concert work should facilitate progress in the accomplishment of gymnastic and hygienic as well as educational purposes. Pupils of like abilities should be grouped together. Defective classification retards progress and entails modifications of procedure calculated to restrict effort to the minimum or average requirement.

III. The usual order of strength tests and measurements should be supplemented by exercises for ascertaining the degree of co-ordinative skill possessed by the pupil, determining his especial fitness for the work of a class or group in gymnastics.

IV. Instruction plans should emphasize definite class aims (see October COURSE OF STUDY) with a purpose in view of realizing the best possibilities by strengthening the general plan.

The various lesson programmes of the past month included tacto-gymnastics, i. e., free exercises executed alternately and simultaneously with marching, hopping, and running exercises in and from place. The order-of-movement direction suggested for the practice of free exercises of the first order (see February COURSE OF STUDY) was augmented by a study of movement possibilities in intermediate directions.

The free gymnastics of the next order will embrace exercises in kneeling, sitting, lying, and stem-supporting positions (on hands and feet), also in head, arm, and hand stand positions. In these positions the movements and exercises, involving elevation, flexion, extension, turning, etc., can be repeated, the respective positions limiting execution to the parts not employed in supporting the body.

The High-School students began a course in fencing during the past month. Foils were selected as weapons. The preliminary practice consisted of the study of the positions "on guard," of attack and defense, without arms; the "appel," advance and retreat, side-stepping and about-facing. The principal lines of attack were practiced with arms.

The natatorium was reopened, and frequented by pupils and students from all classes. The facilities for instruction in swimming are of the best.

Games played by the different grades: Hornet's Nest, Running the Gauntlet, Hare and Hounds—indoors. A description of these games will be furnished in a future number of the COURSE OF STUDY. Other games played: Foot-in-the-Ring, tugging and pulling games between individuals and teams, Indian wrestling. Putting the shot and hurling of grip balls was a favorite practice with the High-School boys. For descriptions, see Vols. II-VII, *Mind and Body*.